



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/623,209	08/29/2000	Alan Dean Michel	P00227- US-1	9934

7590 04/13/2004

Brian T Ster
Ice Miller Donadio & Ryan
One American Square Box 82001
Indianapolis, IN 46282-0002

EXAMINER

LEE, PING

ART UNIT	PAPER NUMBER
----------	--------------

2644

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/623,209

Applicant(s)

MICHEL ET AL.

Examiner

Ping Lee

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings were received on 1/9/04. These drawings are approved.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 6, 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Mitchell et al (US 3,644,674).

Regarding claims 1 and 12, Mitchell et al (hereafter Mitchell) shows the first and second microphones (M1 and M3; M1 and M4; or other similar combination), the combining means (7), the cross-over means for producing a single monaural signal ("OUTPUT" in Fig. 4) comprising a first filter means (3a,3b or 3c) for filtering only one of the first or second signals, a second filter means (8), and a unifying means (9, 10b). The claimed a single monaural signal "with an extended frequency bandwidth response" is met because the speech signal, after removing the noise, has an extended frequency bandwidth response.

Claims 1 and 12 also can be rejected based on the following. Mitchell shows the first and second microphones (M1, M2), the combining means (4) and the cross-over means for producing a single monaural signal ("OUTPUT" in Fig. 4) comprising a first

Art Unit: 2644

filter means (3, "delay" is an all-pass filter) for filtering only one of the first and second signals, a second filter means (5), and a unifying means (6, 10a, 7, 8, 9, 10b). The claimed a single monaural signal "with an extended frequency bandwidth response" is met because the speech signal, after removing the noise, has an extended frequency bandwidth response.

Regarding claims 6 and 17, Mitchell shows the means for subtracting.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 6, 10-12, 17, 21 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Wakui (US 5,701,344).

Regarding claims 1, 11, 12 and 22, Wakui shows the first and second microphones (31, 32), the combining means (38), the cross-over means for producing a single monaural signal (at "h") comprising a first filter means (35 or 36) for filtering only the first or second signals, a second filter means (40,45 to D), and a unifying means (43). The claimed a single monaural signal "with an extended frequency bandwidth response" is met because the audio signal, after removing the noise, has an extended frequency bandwidth response.

Regarding claims 6 and 17, Wakui shows the means for subtracting (38).

Regarding claims 10 and 21, Wakui shows the low pass filter (40).

6. Claims 1, 7, 9-12, 18, and 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Chu (US 5,715,319).

Regarding claims 1 and 12, Chu shows, in Fig. 3, the first and second microphone means (generating "LEFT" and "RIGHT" signals), the combining means (331), the cross-over means for producing a single monaural signal (from 350) comprising a first filter means (310, 320) for filtering only one of the first or second signals, a second filter means (341), and a unifying means (350). The claimed a single monaural signal "with an extended frequency bandwidth response" is met because the audio signal, after removing the noise, has an extended frequency bandwidth response.

Regarding claims 7, 9-11, 18 and 20-22, Chu shows the high band equalization, low band equalization (310) and the corresponding filtering delay (element 320)

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 2, 3, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakui or Mitchell.

Regarding claims 2, 3, 13 and 14, Wakui or Mitchell fails to show the first or second microphones as the omnidirectional microphones or a plurality of omnidirectional microphones. Both Wakui and Mitchell use a general microphone for receiving the noise and the speech, wherein, one skilled in the art would have expected that the omnidirectional microphone would provide this function with wide area coverage. Thus, it would have been obvious to one of ordinary skill in the art to modify the system of Wakui or Mitchell by utilizing omnidirectional microphone or omnidirectional microphones as the reception transducers in order to receive a sound from different directions and thus providing a wider reception area.

10. Claims 4, 5, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakui or Mitchell in view of one of these references, Barlett (US 5,473,684), Josephson et al (US 5,627,901) or McAteer (US 5,703,957).

Regarding claims 4, 5, 15 and 16, Wakui or Mitchell fails to show the first or second microphones as the first order gradient microphone or a plurality of first order gradient microphones. Wakui or Mitchell uses a general microphone for receiving the noise and speech, wherein, one skilled in the art would have expected that the first

order gradient microphone would provide this function with a narrower coverage area; i.e. it provides a speech enhanced signal when the first gradient microphone is being aimed at the speech source location. Barlett, Josephson et al, or McAteer each teaches such a first order gradient microphone. Thus, it would have been obvious to one of ordinary skill in the art to modify Wakui's or Mitchell's system by utilizing first-order gradient microphone or a plurality first-order gradient microphones as the reception transducers in order to receive a sound from a particular direction, and thus providing a noise reduced speech signal when the speech source is at a predetermined location.

11. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu in view of Helf et al (US 5,550,924).

Regarding claims 8 and 19, Chu fails to show that the second filter means comprising filtering delay. However, Chu suggested to incorporate noise reduction on the optimized narrow band signals before performing inverse FFT. Helf et al (hereafter Helf) teaches a noise reduction for speech enhancement including filtering delay. Noticed that Helf is the cited copending application (col. 7, lines 4-19). Thus, it would have been obvious to one of ordinary skill in the art to modify Chu's system by incorporating the noise reduction for the optimized narrow band signals in order to enhance the speech intelligibility.

Response to Arguments

12. Applicant's arguments with respect to claims 7-12 and 18-22 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 2644

13. Applicant's arguments filed 1/9/04 have been fully considered but they are not persuasive.

Applicant argued that Mitchell or Wakui fails to show the claimed cross-over means.

Based on the amended claims, Mitchell does show the claimed cross-over means comprising the first filter means (3) and second filter means (8). The output is a monaural signal ("OUTPUT") having inherent extended frequency bandwidth response. See rejection above. Reference Wakui also shows the claimed invention. See rejection above. Furthermore, Wakui's element 43 reads on the claimed unifying means because it combines the first filter output (from element 36) with the second filter output (from 40,45 to D) to produce a monaural signal with inherent extended frequency bandwidth response.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

Art Unit: 2644

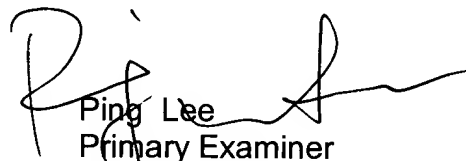
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 703-305-4865.

The examiner can normally be reached on Monday and Tuesday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.


Ping Lee
Primary Examiner
Art Unit 2644

pwl
January 30, 2004